interferometer is divided into a hand-held holographic probe which is being installed on the object that is to be investigated and a holographic camera which may be situated in a protected in-door environment. The hand-held holographic probe alows to measure residual stresses on surfaces of an object with high curvatures, in places where access is difficult, and under many weather conditions by a simple hand-held manual positioning of the holographic probe during the measurements.

AA1

The paragraph beginning on page 4, line 7, has been amended as follows:

The first mentioned drawback has been overcome in a device for measuring residual stresses, where a "dislocation" release of the residual stresses was employed (see applicants corresponding Norwegian application no. 20002601). Let us consider this device and stages of its operation in more detail with reference to Figures 1-3. The device includes an optical device (101) and an electronic device for a "dislocation" release of residual stresses (111) with electric current supply electrode (114). The optical device (101) is intended for formation and registeration of holograms from an area of the object as well as for formation of interferograms of the above area after releasing the residual stresses. It includes a coherent light source (102), a holographic interferometer with optical elements (103-104) for formation of a reference- (105) and object (106) beam, and a recording medium (107). All

AA2

components in the optical device (101) are rigidly connected with regard to each other. The optical device also includes a device (108) for positioning and fixation on the object (109). The electronic device for "dislocation" release of residual stresses (111) with an electric current supply electrode and clamping device (114), is intended for non-destructive release of residual stresses within a certain area (the investigation area) of an object. The electronic device comprises a generator (110) which is able to deliver high-current rectangular pulses (pulse parameters are within the range: amplitude 1-10 kA, duration 20 μs - 20 ms and recurrence frequency 0-100 Hz) and an electric current supply electrode with clamping device (114) connected to the generator. The base of the electric current supply electrode is made as a half-sphere with radius 1,5-5 mm. Both the electric current supply electrode (114) and clamping device are located structurally in the optical device (101).

AA2

The paragraph beginning on page 10, line 1, has been amended as follows:

The device consists of a holographic probe (1), holographic camera (2), control unit (3), and single-mode light guidance cables (4), (5) and (6). The holographic probe (1) is installed and kept manually by the operator on the investigation area of object (7) during measurements of residual stresses, and it contains a spacer portion (30), two optical connectors (8) and (9) and a current-

AA3

AA3

supply electrode (10) with means (11) for putting it into junction with the surface of the investigation area of the object (7).

The paragraph beginning on page 10, line 19 and ending on page 11, line 3, has been amended as follows:

AA4

In addition, the device for measurement of residual stresses includes a minicomputer (12) with display (21) and a printer (22). As one can see from Figs. 4-6, in the preferred embodiment of the invention, the optical connector (17) is connected in one end to the source of coherent light (16), and the other end is connected to the beam splitter of coherent light (18). The single-mode light guidance cable (4) is connected in one end to beam splitter (18), and the other end is connected to optical connector (8). The single-mode light guidance cable (5) is in one end connected to optical connector (9), and the other end is connected to optical connector (13). The single-mode light guidance cable (6) is in one end connected to the beam splitter (18), and the other end is connected to optical connector (14). The electric cable (23) is in one end connected to the current supply electrode (10) via the contact group (24) and the lever (25), and the other end is connected to the generator of high-current electric pulses located inside the single case (19) of the control unit. The electric cable (26) is in one end connected to the recording medium (15), and the other end is connected to the device for controlling the recording medium operation located

inside the single case (19) of the control unit. The electric cable (27) is in one end connected to the source of coherent light (16), and the other end is connected to the power supplier of the coherent light source located inside the single case (19) of the control unit. The electric cable (28) is in one end connected to the TV-camera (20), and the other end is connected to the power supplier for the TV-camera located inside the single case (19) of the control unit. The electric cable (29) is in the one end connected to the TV-camera (20), and in the other end to the minicomputer.

AA4

The paragraph beginning on page 11, line 4, has been amended as follows:

The holographic probe (1) is installed by an operator on the investigation object in such a manner that optical connector (8) illuminates the investigation area of object (7) (see Fig. 4), and the optical connector (9) collects the light scattered by the investigation area of the object. Optical connectors (13), (14) are located in the holographic camera (2) such that optical connector (13) forms the object beam (see Fig. 4) and send it to the surface of recording medium (15), and optical connector (14) forms the reference beam and send it to the surface of recording medium (15).

AA5

The paragraph beginning on page 11, line 11, has been amended as follows:

In this preferred embodiment of the invention, it is important that the optical connector (17) and the beam splitter of coherent light (18) are rigidly fixed on the coherent light source (16), that the optical connectors (8) and (9) are rigidly connected with regard to each other on the holographic probe (1), that the holographic probe (1) is installed by the operator on the investigation area of the object in such a way that it could not move relative to the investigation area of the object during the investigation, i.e. from the moment of registration of the hologram and until the moment when the interferogram has been formed, and that optical connectors (13), (14) and recording medium (15) are rigidly connected with regard to each other in the holographic camera (2) at fixed distances determined by specific requirements for formation and registration of the hologram. It is also important that the electric current supply electrode (10) is arranged in the holographic probe in such a way that after installing the holographic probe on the investigation area of the object, it could easily be put into junction with the surface of the investigation area of the object without causing any displacements or vibrations of the holographic probe.

A16

The paragraph beginning on page 11, line 27 and ending on page 12, line 2, has been amended as follows:

Such an embodiment of the device for non-destructive real-time measurement of residual stresses by optical holographic interferometry allows to design the device as comprising two major parts. One of which is the holographic probe installed and kept manually by the operator on the investigation area of the during the measurements, while the other part is the holographic camera situated separately from the investigation object in another place under comfortable conditions. Also, an auxiliary part, the control unit, may be situated separately from the investigation object, in another place, as a rule, together with the holographic camera. In this case, the holographic probe during the measurements can be easily moved by operator along surface of the investigation object within the limits of lengths of single-mode light guidance cables without causing changes in the optical path lengths for the coherent light used for formation of the object and reference beams. And thus, it is allowed to register and develop the hologram and to form the interferogram of the investigation area of the object in comfortable conditions.

AA7

The paragraph beginning on page 12, line 20 and ending on page 13, line 3, has been amended as follows:

AA8

In the first stage, the registration of the hologram of the investigation area of the object is performed. The holographic probe (1) is installed on the investigation area of the object (7). The coherent light source (16) is switched on and the recording medium (15) is prepared to make a registration. Coherent light from the coherent light source (16) is sent through the optical connector (17) to the splitter of coherent light (18), where it is divided into the object- and reference coherent light. The object coherent light is delivered by the single-mode light guidance cable (4) to the optical connector (8) located in the holographic probe (1) where it is expanded and sent onto the investigation area of the object (7). The object coherent light scattered by the investigation area of object (7) is collected by optical connector (9) located in the holographic probe (1) and is sent into the single-mode light guidance cable (5). With the use of the single-mode light guidance cable (5), the object coherent light is delivered to the optical connector (13) located on the holographic camera (2). Further, with the use of optical connector (13), the object coherent beam is formed from the delivered object coherent light and is sent onto the surface of the recording medium (15). At the same time, the reference coherent light is delivered by the single-mode light guidance cable (6) to the optical connector (14) on the holographic camera (2). Then, with the aid of optical connector